



1+1>2

Fixed Mobile Convergence

A Huawei White Paper by
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CONTENTS

1 Executive Summary.....	1
2 Key Drivers for FMC.....	2
3 Customer's view of FMC.....	4
3.1 Single Customer Journey.....	4
3.2 Smart Home.....	6
4 What makes FMC 1+1>2?.....	8
5 Conclusion: Keys to FMC's Greater Value.....	9
6 References.....	12
7 About the Authors.....	13



1 Executive Summary

Fixed & Mobile Operators are moving rapidly to establish themselves as full service operators for N-play services to address revenue decline and loss of market share due to intense competition. Fixed Mobile Convergence (FMC2.0) will remove the distinction between Fixed and Mobile networks to provide seamless service experience for N-play services to consumers across connected devices at home and on the move.

The challenge for Operators implementing FMC 2.0 is to deliver convergence services from:

- 1) combined fixed & mobile networks
- 2) operations that can effectively deliver and manage the user experience across the different networks & customer touch points and channels
- 3) voice, data, video & smart home services on the move, at home and offices that bridge seamlessly across fixed and mobile networks

If successful, Operators can reap the benefits of FMC 1+1>2 with:

- 1) revenue stabilization & growth
- 2) customer churn reduction
- 3) increased ARPU
- 4) subscribers growth
- 5) new revenue generation as demonstrated by Telefonica, KPN, China Mobile, & KDDI. Customers will also perceive greater “value for money” for converged services if supported by good user experience.

2 Key Drivers for FMC

Fixed Mobile Convergence (FMC) services have seen a resurgence of interest and rapid development in the past years brought about by industry consolidation and challenges:

- Changing consumer behavior (video everywhere, on-line services, social networking, & companion screen)
- Saturation in Smartphone Market slowing growth in wireless necessitating focus on Fixed Services
- Multitude of services and apps accessible via the internet
Extensive coverage of Wi-fi hotspots
- Industry consolidations call for Operators to develop the Single Customer Journey

FMC represents a shift in operators brand marketing by allowing to take advantage of Omni-Channel strategy by unifying fixed and mobile service offerings creating brand loyalty by delivering a consistent brand experience across all channels.

Telecom Operators are trying to stay competitive not only with other Operators but also with OTT service providers. Many Operators are moving quickly to implement Quad-play or N-play services to stay relevant in the market place and to reduce customer churn and address revenue decline.

Convergence in their service offering not only supports a shift to video but can leverage it to retain revenue growth in a market slowed by smartphone saturation. Video represents > 50% of mobile data traffic and the shift to larger displays on devices supports the users viewing habit. This year, for the first time, smartphone users will surpass 2 billion for 2016,* signifying that more than one-third of the world's population will have smartphones and operators will need to find ways of maintaining revenue growth. In fact, since mobile cellular subscriptions in total have reached almost 7 billion by end of 2015 with a penetration rate of 97%.



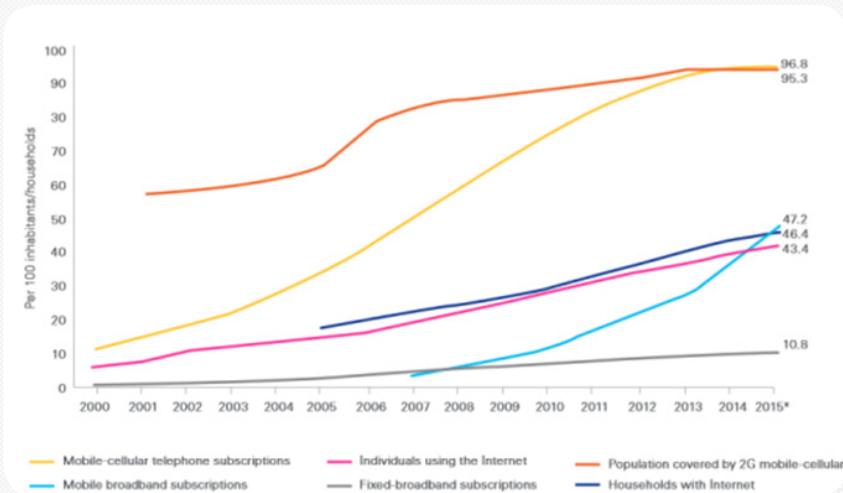


Figure 1: Global internet penetration (Source: ITU)

Global internet penetration between 2000 and 2015 jumped from 6.5% to 43% in the past 15 years while fixed broadband subscription grew at a humble 7% increase every year and is on pace to serve 11% of the global population by end 2015. While MBB Video has experienced CAGR for data of 120 % increase between 2000 and 2015, FBB has seen modest growth and can expect CAGR for data to be about 32% from 2015 to 2020. (source: Cisco VNI Report 2016)

Fixed Operators are acquiring Mobile companies (e.g. BT, PCCW). In turn, Mobile Operators are acquiring fixed network (e.g. Vodafone) or building out fiber network for their backhaul and FMC services (e.g. China Mobile & Mobily).

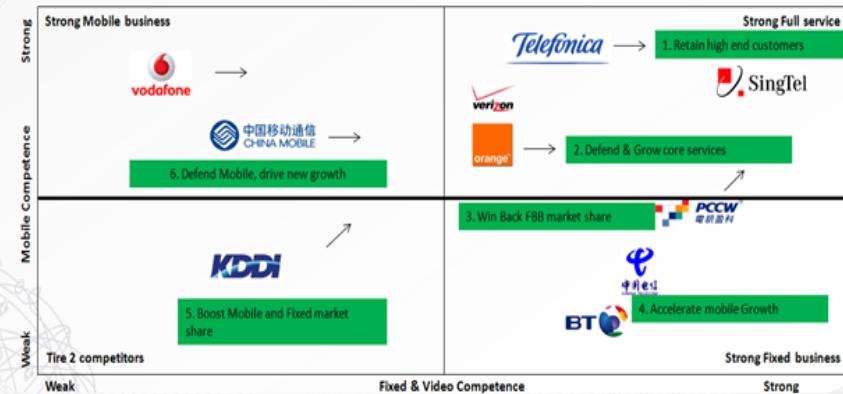


Figure 2: Forecasted convergence subscribers

Convergence Subscribers are forecast to grow 25% CAGR avg. from 2014. (ref: Huawei Analysis)

3 Customer's view of FMC

Single Customer Journey

Convergence through the eyes of the customer can be seen as the convenience of utilizing fixed and mobile services from a full service provider, and being able to take advantage of bundled offers with innovative services. It is also about viewing the same content across all devices without having to pay fees to multiple service providers. The Single Customer Journey in relation to mobile convergence is best described as the series of steps involved in accessing content on mobile and subsequent home viewing platforms. It describes how they feel about the experience, whether it provides theme, the content or app's desired in a timeframe that satisfies their viewing and consumption desire (ref: Huawei's ITU-approved U-VMOS index).

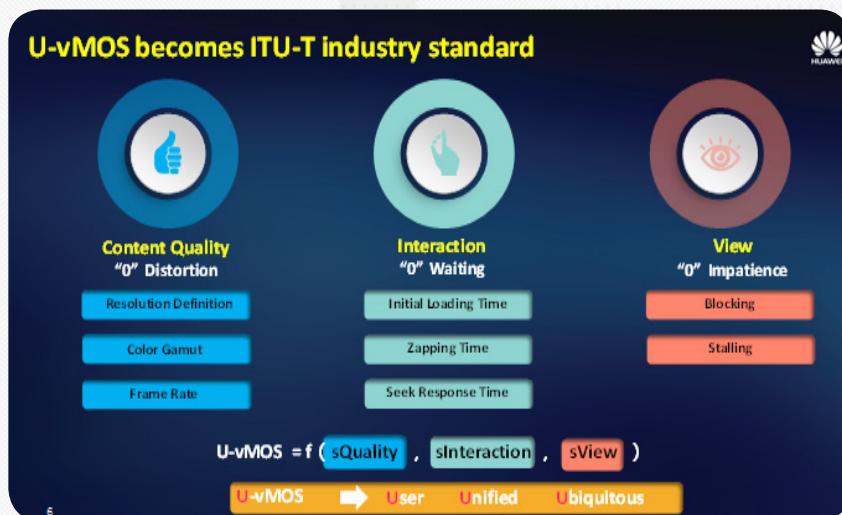


Figure 3: Huawei's ITU-approved U-VMOS index

For the operator, good user experience is significant in customer retention and in keeping the customer making additional purchases beyond base subscription. Operators must recognize the trend of viewing content or surfing the web on mobile devices while simultaneously watching a movie or series on the home TV. It is also becoming more prevalent for them to offer TV or "access to content" as part of a service bundle. Operators can leverage success in mobile TV





to make broadband more of a commodity by providing quality content bundles which creates an opportunities for added ARPU from fixed services.

*Accenture reported last year that “87% of consumers use more than one device at a time” and that on a global scale, the smartphone is the most frequent used device scoring 57% simultaneous usage.

Mobile viewing habits usually occur away from the home either while traveling or commuting back & forth to work. It is common for the “always on” viewers to continue watching content at home that they were viewing on the mobile. This necessitates the need for consumers to receive a seamless single customer journey with unified user interface (UI) for content search & recommendation, site navigation and social networking. UI’s for video platforms are no longer just a listing of content titles but also provide the pathway for consumers to access app, games, email, browsers and OTT services.

The user interface should be uniform across all platforms and be set up as you would any retail site such that the customer can navigate and find what they seek using a 2 click strategy. Digital marketers use this strategy along with heat map data to set up their site so customers can quickly find the product they are looking to buy. Operators and OTT service providers should be conscious of this type of data tracking for usability and incorporate this into the UI design as well as make regular modifications to optimize the viewers experience.

Netflix UI

A screenshot of the Netflix mobile user interface. On the left is a dark red sidebar with the Netflix logo at the top and a list of navigation options: My Instant Queue, My Recommendations, New Releases, Last's Week Top Choices, Browse Genres, Search, and Sign Out. To the right is a grid of movie thumbnails, each with a small image, the title, and a star rating. The movies shown are: Super High Me (4 stars), Chop Shop (4 stars), Romance & Cigarettes (4 stars), Scarface (4 stars), Donnie Brasco (4 stars), Painless (4 stars), Yellow Asphalt (4 stars), and Beaufort (4 stars). At the bottom of the screen are several small buttons for different features like Watch Later, Watch Now, and Account.

Netflix UI Heat map



In addition to making the UI user friendly, operators must see the UI as a means of generating additional revenue by not only placing subtle advertisement on it but also using the UI as a marketing tool.

Additional UI Features

- Target Marketing
- Push Advertising
- Customer Analytics
- Maintain brand loyalty
- Subscriptions VOD
- Pay per View Events & Content

Smart Home

Bringing consumers homes online is another development that further unlocks the value of FMC. Consumers are becoming more receptive to a digital home lifestyle and can now manage and monitor intelligent home solutions via an app on their smartphone. By definition, a smart home is a dwelling that has advanced automatic platform/system that manages and controls lighting, temperature, security, multimedia

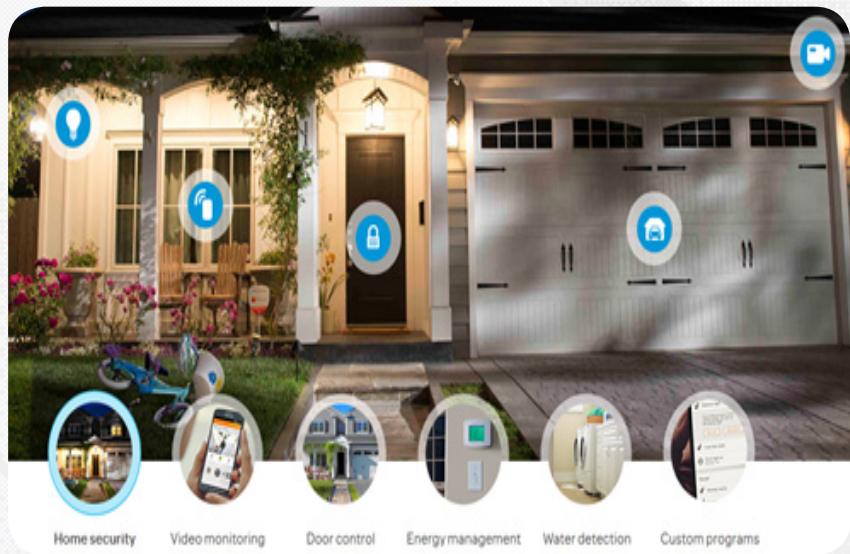




systems, wireless data access, and utilities/energy management. The term "smart home" denotes that a home may be "intelligent" because it can monitor many aspects of daily living functions and systems. The days from futuristic concepts of a refrigerator that can inventory its contents, suggest potential menus for the evening meal, recommend healthy alternatives, and even automatically restock its groceries are now part of the here and now.

Smarthome's current evolution can be seen as a direct benefit of the development of FMC. Advancement in mobile applications that provide connectivity to smarthome solutions also benefit from a converged lifestyle. Customers can now monitor door locks, thermostat changes, enable video door bells & home security cameras. Carriers can now provide an end to end security solution by providing the fixed bandwidth required for the increased data traffic and provide high resolution live feeds that are critical to a reliable security home monitoring system now.

AT&T Smart Home Solution



The converged user experience is a single customer journey experiencing innovative services that are seamless, user friendly, responsive, safe and secured.

4 What makes FMC 1+1>2?

Fixed Mobile Convergence is about creating seamless services to provide a superior experience to customers whether it is voice, data, or video to meet their needs in home, offices or on the move using a combination of fixed broadband and local access wireless technologies. Customers' perceive value of Quad-play or N-play services are much greater than individual services making it 1+1>2, if supported by good user experience. From Operator's perspective, convergence subscribers are less likely to churn with greater potential to increase spend by upgrading packages and buying more services. It also provides operators a means of maintaining QoS by offloading the video services from the mobile via switchover to customers' home wifi.

Operator can also achieve greater value than simply bundling services together i.e. 1+1>2.

Telefonica Spain introduced its "Fusion" N-play service in Q3 2012 to address decline in mobile subscribers due to intense competition. As of Q3 2015, Telefonica has grown the service to 3.9 million subscribers with converged services. Telefonica has been able to retain high end customers while growing their subscribers with the best FTTH network, multi-screen video everywhere service with 100+ channels, attractive mobile data upgrade plan, and smart home service. Operator can achieve 4 strategic benefits from FMC.

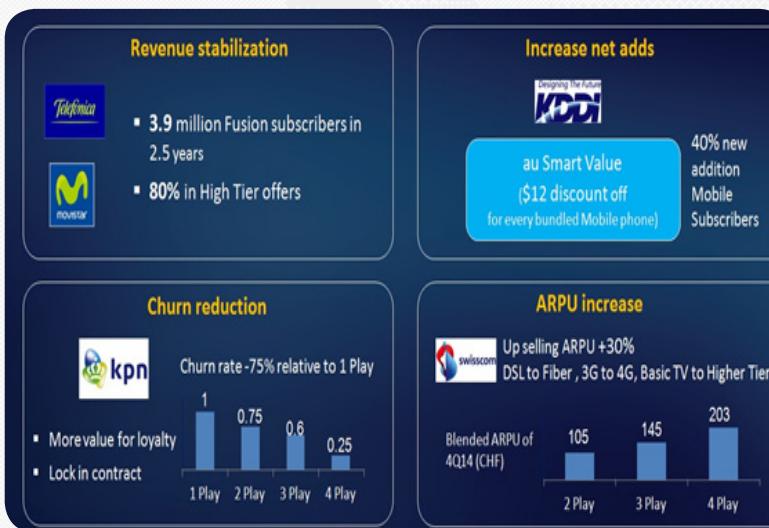


Figure 5: Benefits of FMC



The Telefonica success along with many European operators, as well as those in America, demonstrate how to maximize capability and increase value since they are in developed markets. As markets begin to evolve from what is considered a “developing” market such as parts of South East Asia, they will also be able to see capitalize on the benefits of Fixed Mobile Convergence.

5 Conclusion: Keys to FMC's Greater Value

There are 3 major areas to consider towards implementing FMC. They are 1) network convergence, 2) operations convergence, and 3) service convergence.

1) Starting with network convergence, mobile operators need to build out a fiber network to complement its 4G/LTE network. Fixed Operators move to convergence services is to acquire a Mobile service business. Operators will need to bond the Fixed and Mobile networks to ensure a smooth handoff between the two networks to provide seamless user experience. Huawei offers a WTTx (Wireless Fiber based LTE) solution that allows for network build on demand, high optical distribution network efficiency, and options for fixed and wireless access network with low capital investment and short payback period on investment vs. standalone fixed and mobile network investment.

The Fixed and Mobile networks work together to handle peak traffic load, to enhance broadband capacity for subscribers growth, to deliver best U-VMOS (Video) experience with quick access, fast downloading, & better picture quality management for content viewing.

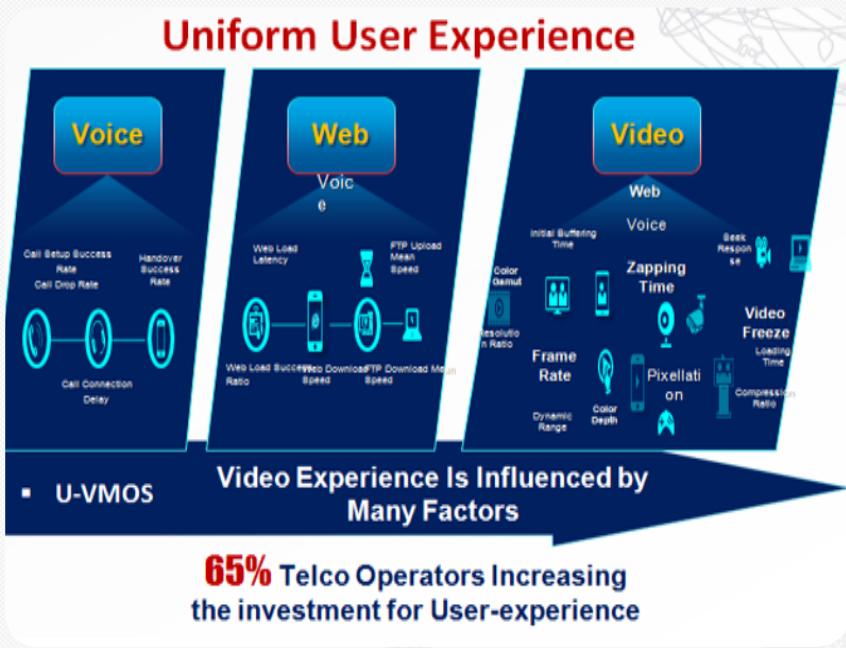


Fig.6 Uniform User Experience

2) Operations convergence is the corner stone of FMC linking the networks with services. It encompass all the back office systems that manage the different customer touch points via the omni-channels that are facilitated via Web, Call Center, Shops, SMS, Social and the internet. Operations Convergence will need to provide fast and efficient service provisioning and restoration on the bundled services. It will need to have operational data transparency across functions, effective IT integration with ecosystem partners and data analytic capabilities to manage overall performance.

3) Service convergence starts with bundled service offers to achieve Quad-play or N-play services. Examples of bundled offers can be illustrated as below:





Package Category	Services
1.FTTH	a) High Speed Broadband : 50Mbps, 100Mbps, 1 Gbps etc.
2.FMC	a) High Speed Broadband + Mobile : Voice minutes, Free calling, Mobile Data plan e.g. 500 Mbps, 1 Gbps. etc. b) High Speed Broadband + IPTV : x Mbps + x Free Linear Channels + HD & 4K content + x hours of On-demand content c) High Speed Broadband + Mobile + IPTV : x Connected devices for Video Everywhere + watch free the same subscribed channels on TV on the move + x no. of smartphones
3.Family FMC Package	a) FMC package for x persons + Smart Home services for video surveillance, metering, mobile remote control + unlimited free calls between family members + upgrade or unlimited data plan + e-Health + e-Education
4.Enterprise/ Ecosystem Partners	a) Unified Communications + Single User ID, Cloud services for storage, Saas for SMEs, b) Wholesale services : PaaS, Content Aggregation service, Customer Experience Management, Billing Services c) Service Integration with Ecosystem partners for Vertical Markets and connected IOT & Wearables, e-Payment, e-Transport, e-Government, OTT Apps

Although the major business opportunity is principally B2C, Fixed and Mobile convergence when combined with Cloud services will also open new revenue generation with Enterprise and Ecosystem partners to deliver B2B& B2C services. High speed broadband everywhere service, and connected devices will help drive innovation and converged services to meet market needs delivering much greater value to end users and businesses. Consumers will stay connected in the digital world with a unified experience when they utilize converged services.

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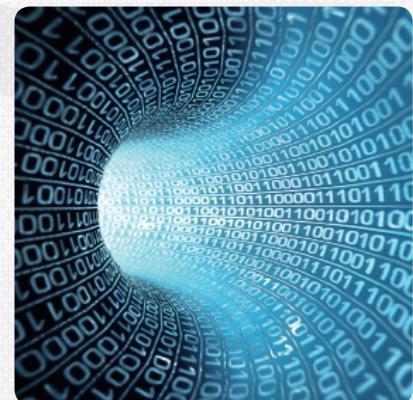
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By Rajeesh Nair

Posted on May 27, 2015



7 About the Authors



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Ted has 23 years of work experience in the Telecommunications industry with a rich commercial and operations background serving in senior positions with Cable Wireless HKT, PCCW, Telemedia Pacific. He has worked on major projects re: Strategic Procurement, Business Process Re-engineering, Customer Service Transformation, Go to Market Strategy, etc.

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Mark is a champion of Broadcast & Video technologies for wireless. Mark's career spans over 16 years in Telecom and Business Development with focus on the international arena promoting emerging technologies.

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